Building Math and Graphic Literacy Skills in Social Studies and Science

Information, Resources, and Strategies for the Classroom

March 2017

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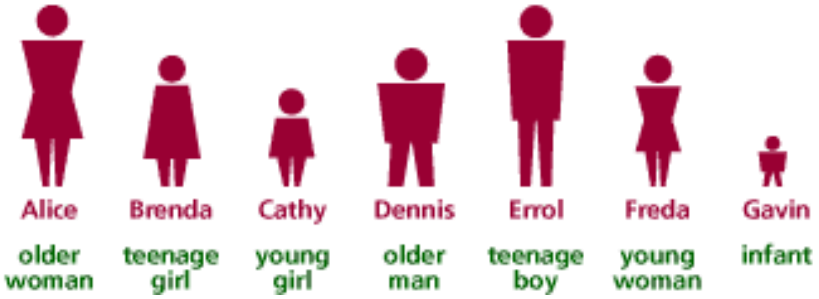
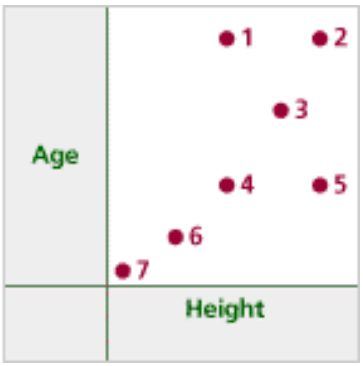
Time Out for a Math Starter

Look at the following graph. Who is represented by each point?





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Circles, Lines, and Bars – Oh My!

- As a large group, brainstorm different categories of data that could be collected in this group.
- Assign each category of data to the individual teams.
- Design your survey questions.
- Collect and organize the data.
- Determine the best way that your teams can present that data by using a
    - Line graph
    - Bar graph
    - Circle graph
- Be prepared to share your team's graph.

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Representing Data in Different Formats

Below is data that shows the length of nails found in a packet of assorted nails. At your tables, identify different ways that you could organize and represent that data.

Length of Nails (mm)									
11	22	29	15	17	27	21	23	27	
26	19	16	11	10	16	15	21	21	17
15	23	20	16	17	25	16	21		

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Paying to Win – Maybe?

In your groups

- Review the data
- Set up the scatter plot
- Answer the questions on the handout
- Be prepared to share your scatter plot and answers
- Complete the whole-class tasks

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Payrolls versus Wins

We often hear about teams that spend a lot of money to bring talented players to their team. It makes us wonder, does a large payroll equal more wins? In this activity, we ask students to compare sports team's payrolls with the team's total wins.

For all students, regardless of sport:

1. What are the variables in this situation? Which is the independent variable? Which is the dependent variable? In general, how do you determine independent and dependent variables for a given situation?

2. Create a scatter plot of the data. Be careful to consider which variable belongs on the x-axis and which belongs on the y-axis. Carefully consider the scales that you will use for each axis. It may make sense to talk this out with your partner or even another group before creating your scales.

3. Does there appear to be a correlation between team salary and total team wins? If so, describe the correlation, is it positive, negative, weak, strong?

Whole class tasks (after seeing scatter plots from all four sports).

4. Only looking at the plots, which of the sports appears to show the strongest correlation between team salaries and total team wins? Which of the sports shows the weakest association?

5. Using the correlation coefficients to compare the data from the four sports, which sport shows the strongest correlation between team salaries and total team wins?

6. Based on the data from the four sports, would you say that there is a relationship between team salaries and wins in the sporting world? Explain your reasoning. To better answer this question, what other information would be useful?

7. Assuming there is a relationship between team salary and wins in any of the sports, would you say the relationship is causation or correlation? Explain your thinking.

Yummymath.com

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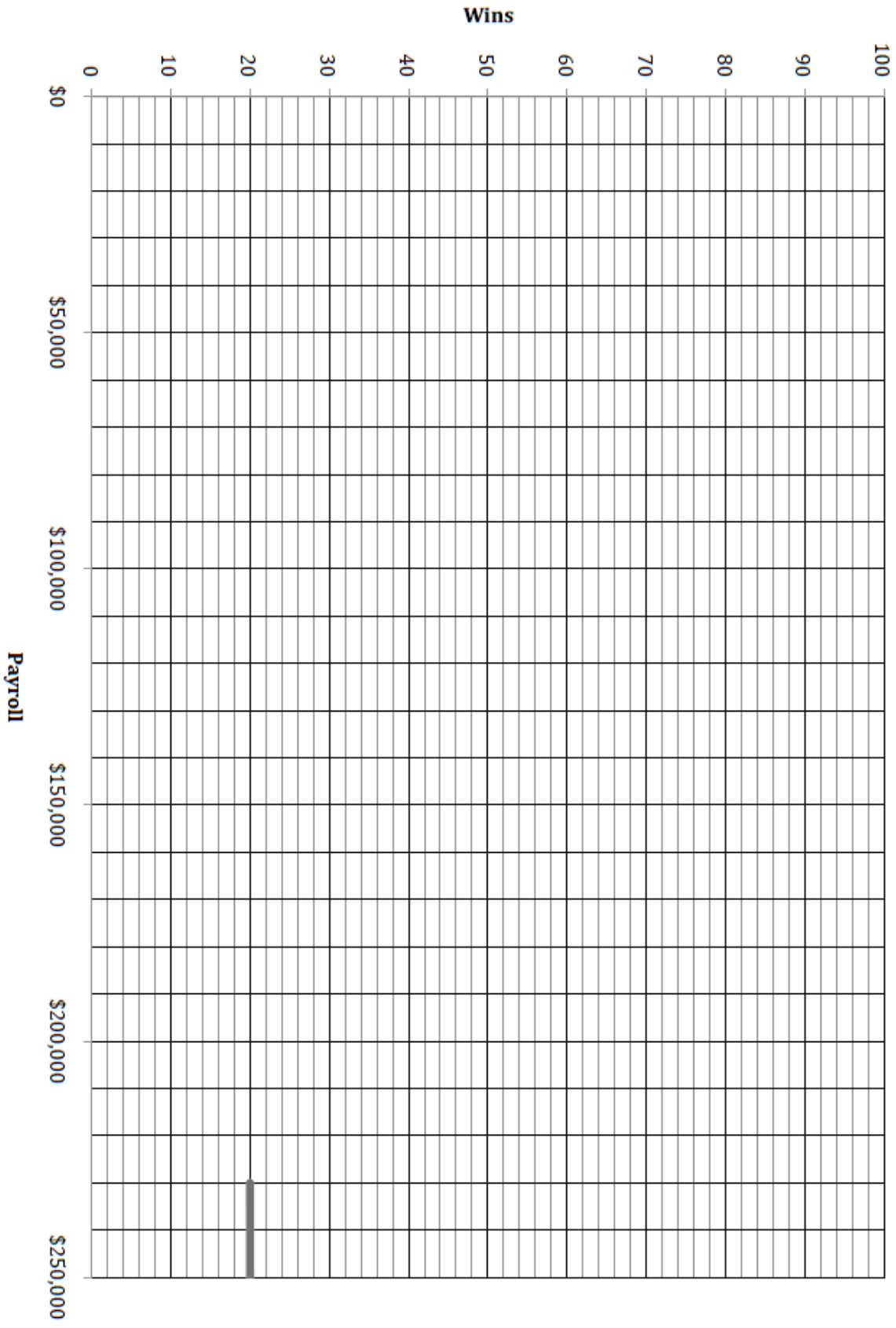

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Combinations – Think, People!

Your task

- Count the people in the room
- Determine how many different groups you could create, including
    - Teams of two
    - Groups of three
- Be prepared to share your work

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It’s Your Turn – How Much Does that Deviate?

Ten friends scored the following marks in their end-of-year math exam:

23%, 37%, 45%, 49%, 56%, 63%, 63%, 70%, 72% and 82%

1) What was the mean absolute deviation of their marks?

2) What was the standard deviation of their marks?

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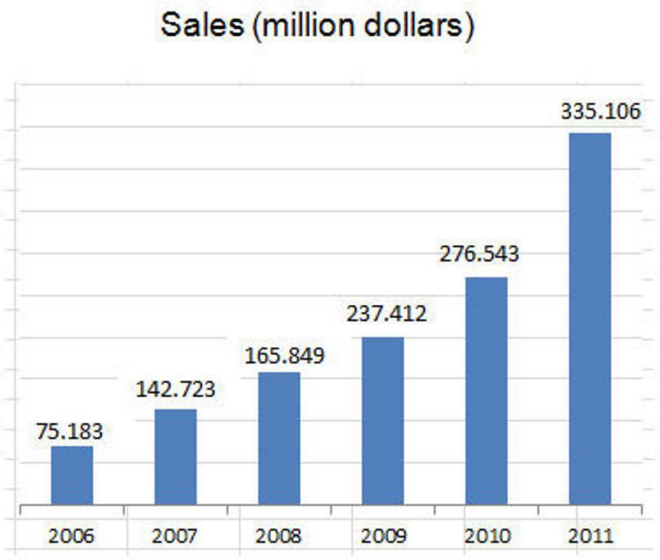
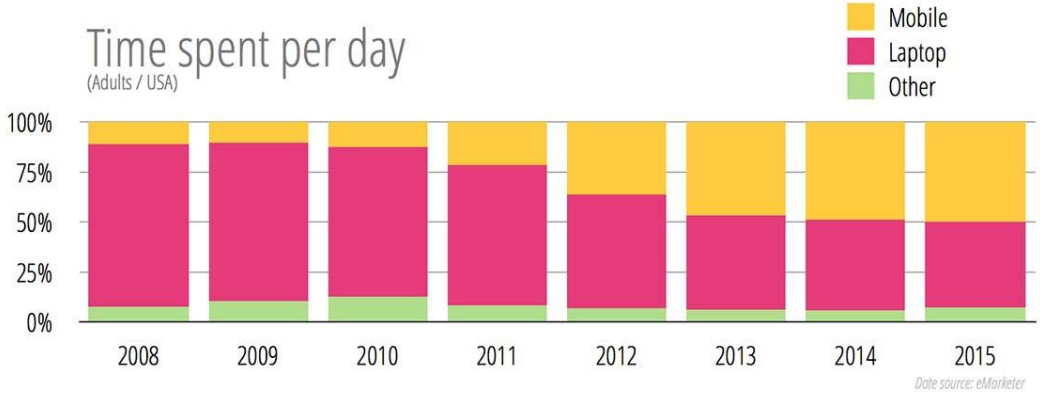
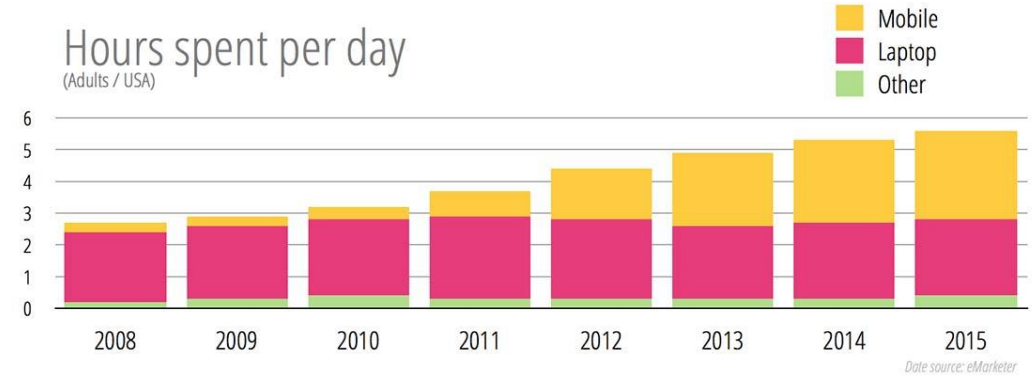
Isn't That a Little Misleading?

Wow, sales are climbing. There has never been an increase like this!



Are laptops a thing of the past?





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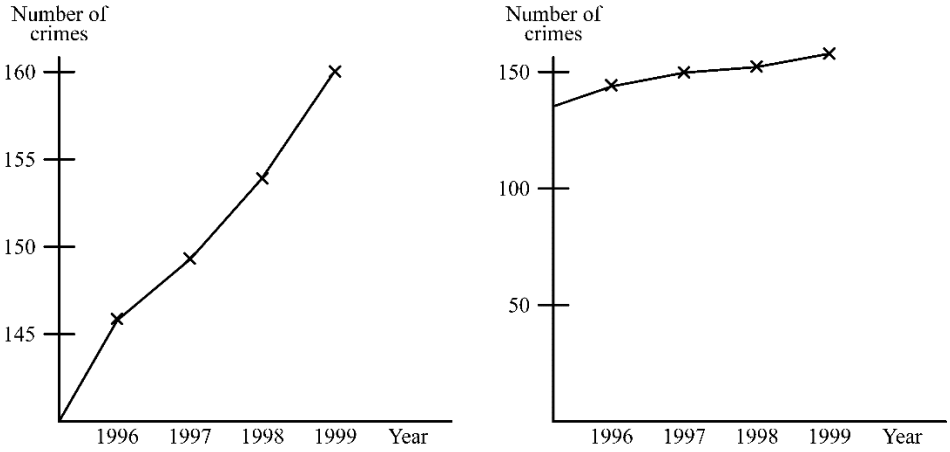
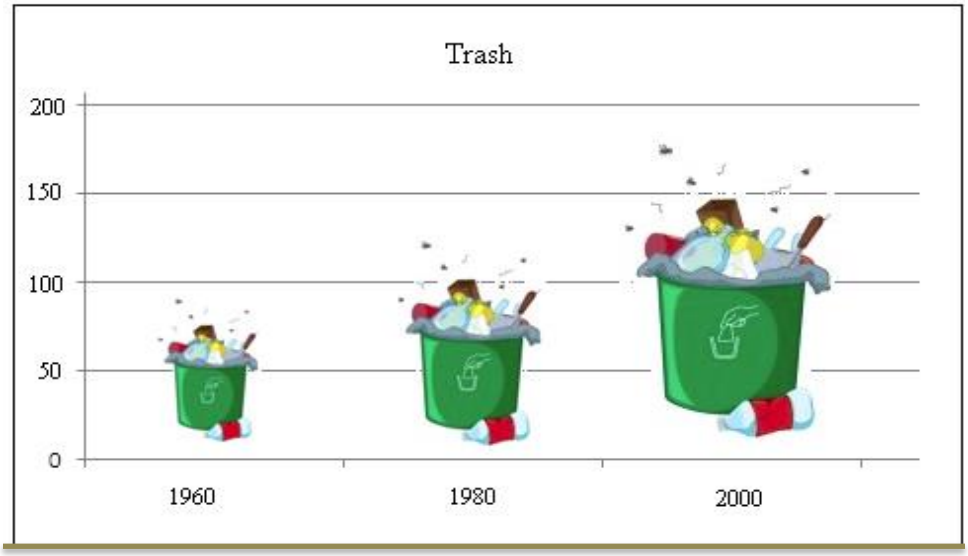
Has crime rate increased rapidly?



Has the amount of trash increased this drastically?



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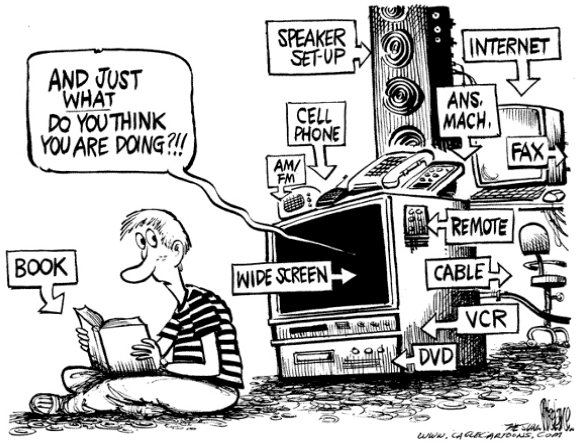
What Does It Mean?



Questions Students Need to Answer

1. What is the event or issue that inspired the cartoon?
2. Are there any real people in the cartoon? Who is portrayed in the cartoon?
3. Are there symbols in the cartoon? What are they and what do they represent?
4. What is the cartoonist's opinion about the topic portrayed in the cartoon?
5. Do you agree or disagree with the cartoonist's opinion? Why?

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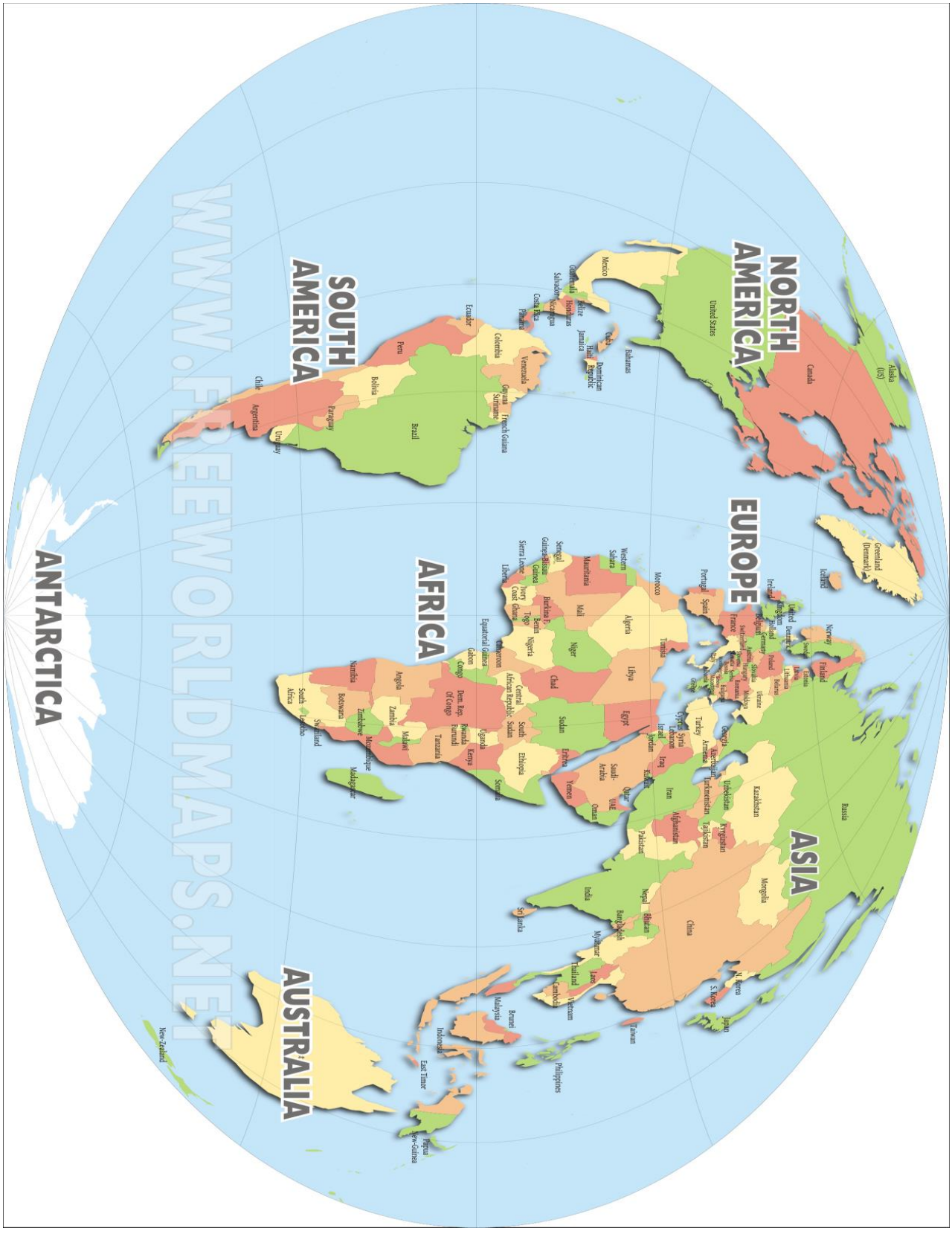
Oh, the Places I've Seen and the Money I've Spent!



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You just won a contest that allows you to travel to one country in three different continents. You get to decide the continents and countries you want to visit. In addition, as the winner you have been provided with $500 to spend in each country.

- Use the web to find the type of currency used in the countries you have chosen.
- Calculate how much you can spend using the local currency.
- Determine which country provides you with the greatest spending power.

Destination Country	World Region Where the Country is Located	Budget in American Dollars	Applicable "Dollars in Foreign Currency" Value Listed in Today's Times	Equivalent Foreign Currency Units (based on the most recent closing market price listed in the "Dollars in Foreign Currency" column of the Times table)
Chile	South America	$500	525.49	262,745 pesos

The New York Times KNOWLEDGE NETWORK | www.nytimes.com/nie

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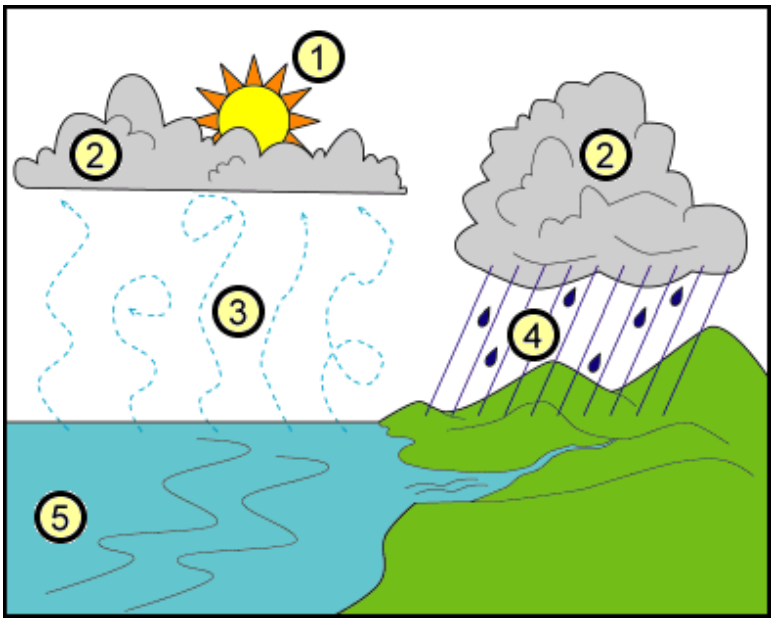
Do Students Know the Vocabulary?

Evaporation, Condensation and Precipitation
The _____ evaporates _____ from lakes and oceans. As the air rises, it cools. The water vapor condenses into tiny droplets of _____. The droplets crowd together and form a _____.

Wind blows the towards the land. The tiny droplets join together and fall as precipitation to the _____. The water soaks into the ground and collects in _____. The _____ that never ends has started again!

Use the diagram to identify the different parts of the water cycle.



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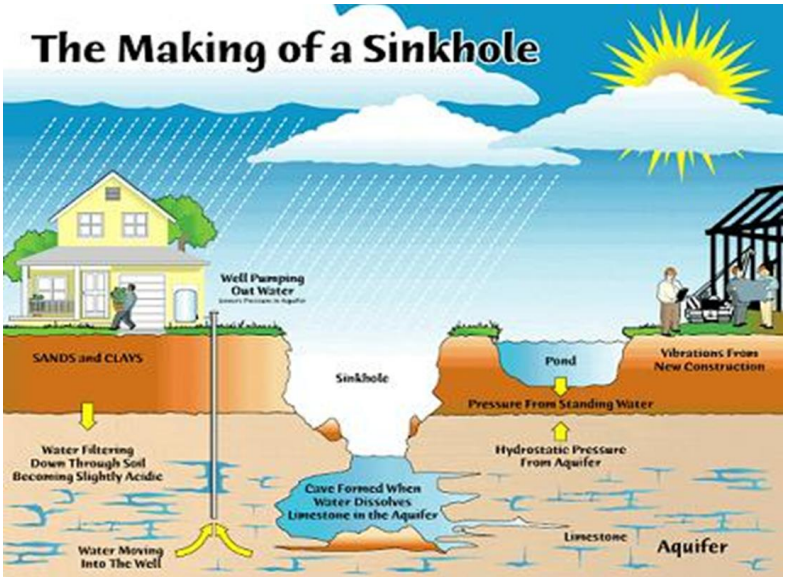
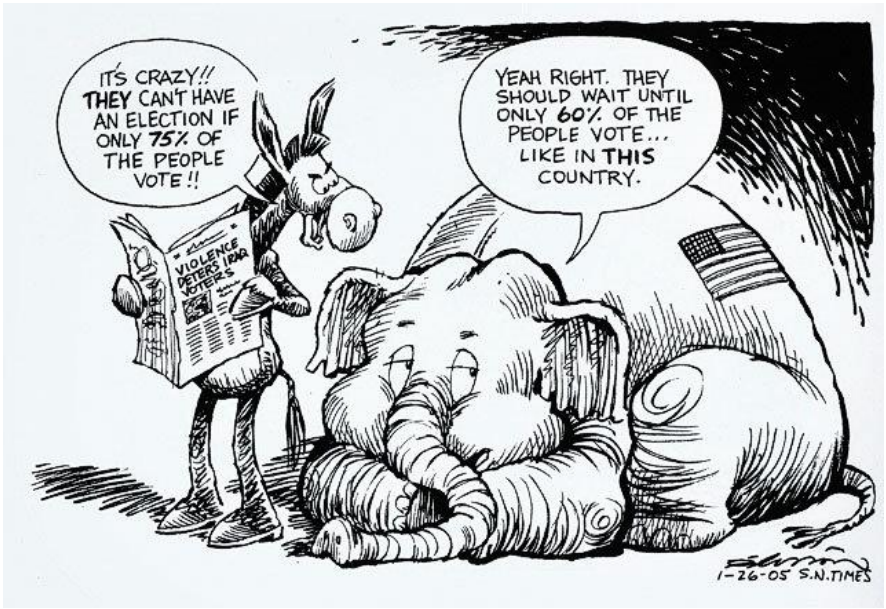
GIST That Graphic!

Answer the 5 Ws and H. Summarize the main idea of the graphic in a sentence of 20 words or less.





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QAR with Graphics

Using QARs with Graphics

Right There	**Author and You**
The answer is in the graphic. The answer is usually easy to find. (You can put your finger on the page and point to the answer.) The words used to make up the question and **the words or numbers used to answer the question are Right There** in the graphic, often as one or more of the labels.	The answer is not in the graphic. You can use the information you **already know** about the topic **AND** Any information the **author has provided in the paragraph or graphic** to answer the question. Use your knowledge and the author's information to answer the question.
Think and Search	**On Your Own**
The answer is in the graphic; however, you must **put together different graphic elements** (titles, legend, data) to reach the answer. The words in the question and the **words or numbers needed to answer the question are not the same.** **Think and Search** different sections or elements of the graphic to answer the question. More than one graphic may need to be consulted.	The answer is **not in the graphic**. Using the information you **already know about the topic or based upon your experience,** you can answer the question. **HOWEVER** Reading the graphic will usually expand your knowledge and will help you give a specific or clearer answer to the question.

Adapted from Raphael, T. (1986). Teaching Question-Answer Relationships, Revised. *The Reading Teacher*. 39, 516-522 and Mesmer, H. A. E., & Hutchins, E. J. (2002). Using QARS with Charts and Graphs. *The Reading Teacher*, 56, 21-27.

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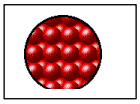
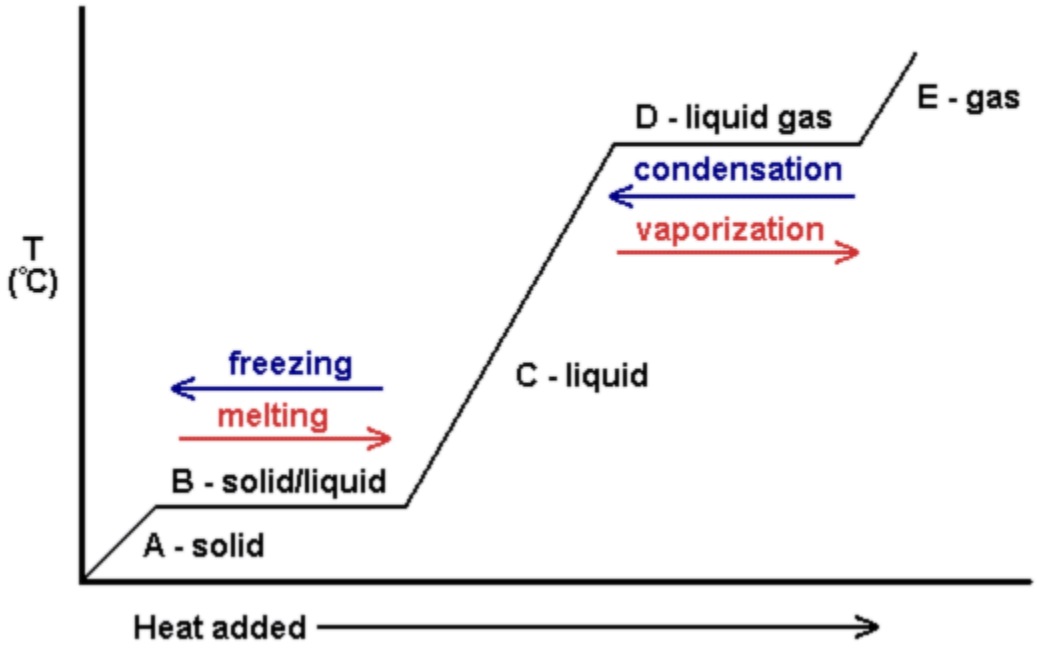
Teach Big Ideas with Graphics

Some Characteristics of Gases, Liquids and Solids and the Microscopic Explanation for the Behavior		
gas 	**liquid** 	**solid** 
assumes the shape and volume of its container particles can move past one another	assumes the shape of the part of the container which it occupies particles can move/slide past one another	retains a fixed volume and shape rigid - particles locked into place
compressible lots of free space between particles	not easily compressible little free space between particles	not easily compressible little free space between particles
flows easily particles can move past one another	flows easily particles can move/slide past one another	does not flow easily rigid - particles cannot move/slide past one another



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Additional Resources for the Classroom

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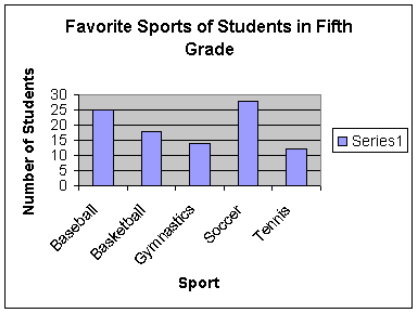
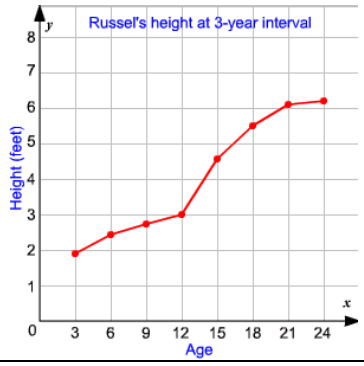
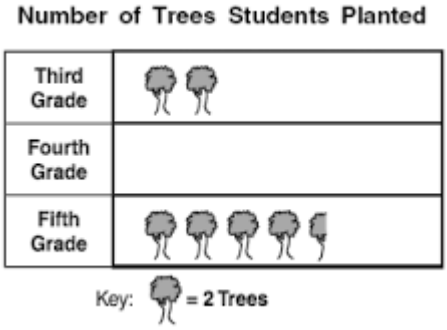
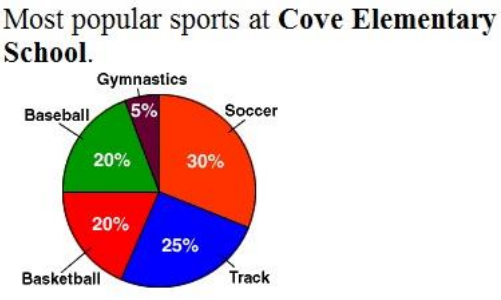
Types of Graphs

Type of Graph	Example	When do I want to use this kind of graph?
A bar graph presents data so that comparisons of different items can be made		• Used to compare the frequency of data • Use a bar graph when you want to compare 2 or more sets of data
A line graph presents data on one item so that changes and trends over time can be identified and comparisons can be made		• Use when you have continuous data • Use when you want to show changes over time
A pictograph presents data using pictures or symbols		• Each picture or symbol represents and assigned amount of data • The key tells the number that each picture or symbol represents • Use when you have large amounts of data that is too big for a bar graph • Use when you only have 2 to 6 categories
A circle graph shows how parts are related to the whole		• Use when you want to show how a total amount of data is divided into parts • Can be used to show percentages • Use when you have 3 to 7 categories

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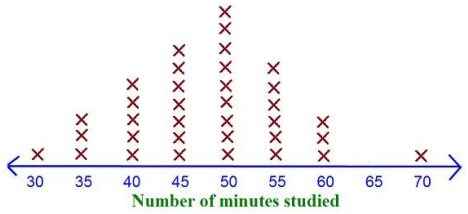
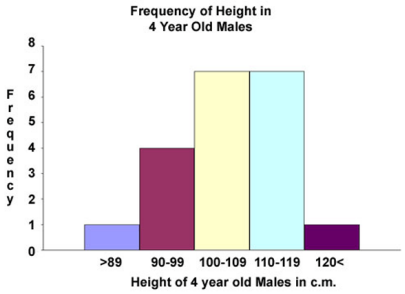
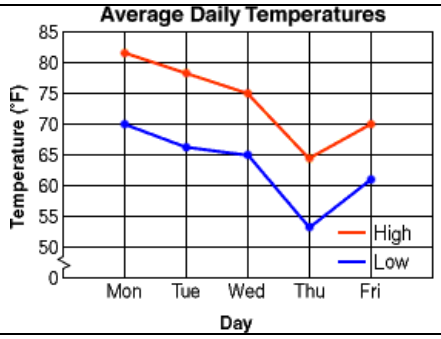
A line plot shows the frequency of data values. The range determines the number line. The x represents the data value.		• Useful when finding the range, mode, mean, and median of a set of data • Easy to identify outliers and clusters • An outlier is a piece of data that is set far apart from the rest of the data • A cluster is where data tends to group together • Best to use this graph when you have a small range
A histogram is a bar graph that shows the frequency of equal intervals of data		• Different than a bar graph because it uses intervals instead of individual numbers and the bars touch • The intervals must not overlap • Good to use with continuous data (ex: weight, height, time, etc)
A stem and leaf plot is a special table where each data value is split into a “stem” and a “leaf”	Grades on a Science Test Stem | Leaf 7 | 2 2 4 5 6 9 8 | 1 4 5 7 7 9 9 | 0 1 3 5 8 10 | 0 0 Key: 7 / 2 means 72 percent	• The stem is the first digit(s) and the leaf is the last digit in a data value • Ex: In the number 72, the digit 7 is the stem and the digit 2 is the leaf • Useful when organizing numerical data
A double line graph is a line graph used to compare two sets of data		• Useful to compare how two things change over time • Each set of data is graphed separately but on the same grid • A key identifies the sets of data

Types of Graphs – Julie Rozier – Teachers Pay Teachers
https://www.teacherspayteachers.com/Product/Types-of-Graphs-Graphic-Organizer-2373146

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Asking Questions of Photographs

Prompts	Answers
What do I see? (What do you observe? What else?)	
What does it remind me of? (Another image? A personal experience?)	
What is the artist's purpose? (To Analyze? Persuade? Express? Document? Entertain?)	
So what? (Why does it matter? What is the significance?)	

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Cartoon Analysis Worksheet

<table>
<tr><td colspan="2">Level 1</td></tr>
<tr><td>Visuals</td><td>Words</td></tr>
<tr><td>1. List the objects or people you see in the cartoon.</td><td>1. Identify the cartoon caption and/or title.

2. Locate three words or phrases used by the cartoonist to identify objects or people within the cartoon.

3. Record any important dates or numbers that appear in the cartoon.</td></tr>
<tr><td colspan="2">Level 2</td></tr>
<tr><td>Visuals</td><td>Words</td></tr>
<tr><td>2. Which of the objects on your list are symbols?

3. What do you think each symbol means?</td><td>4. Which words or phrases in the cartoon appear to be the most significant? Why do you think so?

5. List adjectives that describe the emotions portrayed in the cartoon.</td></tr>
<tr><td colspan="2">Level 3</td></tr>
<tr><td colspan="2">A. Describe the action taking place in the cartoon.

B. Explain how the words in the cartoon clarify the symbols?

C. Explain the message of the cartoon.

D. What special interest groups would agree/disagree with the cartoon’s message? Why?</td></tr>
</table>

The U.S. National Archives and Records Administration.

http://www.archives/gov/education/lessons/worksheets/cartoon.html

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Making Inferences

Reading Between the Lines

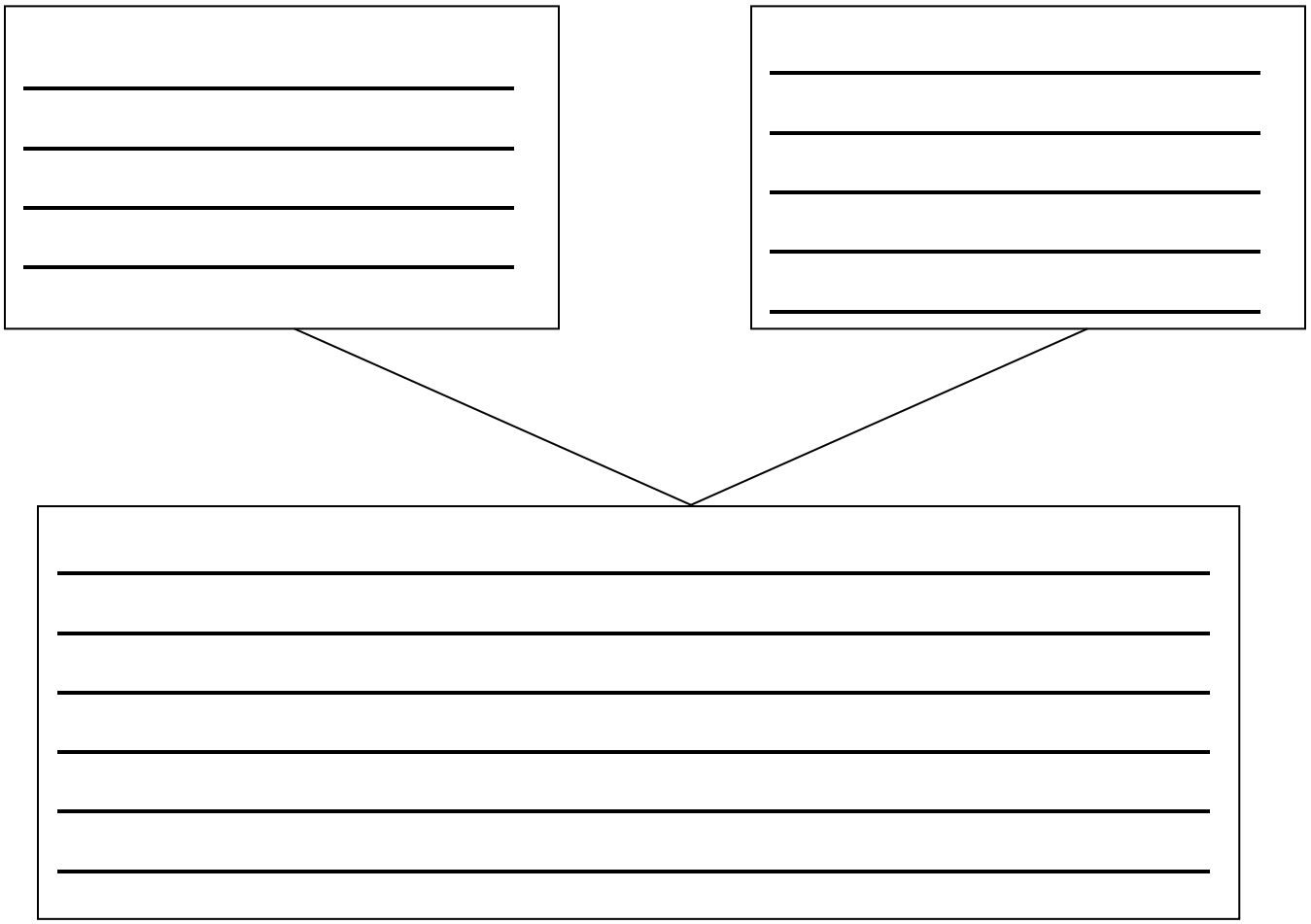
Question:

_____

_____

What I know from the *source material*

What I know from my brain



My Inference

(be sure to use at least one “because”)

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The Scientific Method, Statistics, and M&M's®

Objectives

Students will:

- Identify and describe the different steps of the scientific method
- Conduct a simple experiment that provides a statistical analysis of the total number and frequency of colors of M&M's® in a bag
- Compare their results to the stated M&M's® color distribution ratio
- Present their findings to the class

Materials

- Experimental Procedure worksheet
- 5 Bags of M&M's® per group (regular or fun-sized packages)
- Graph paper and colored pencils
- Calculators

Terms and Concepts

- Frequency
- Hypothesis
- Mean, Median, Mode, Range
- Numerical information
- Random Sampling
- Statistics
- Prediction
- Proportion
- Variables (independent, dependent, constant)

Introduction

Discuss the importance of statistics in the world of science. Share that statistics are facts or data based on a set of numerical information. This is the type of information that is used to support or not support a hypothesis. Sometimes, statistics can be unpredictable, meaning that they do not have any kind of pattern. The numerical information they are based on appears to be *random*. However, many statistics do reveal patterns and can be used to make *models*, form hypotheses, and make predictions about certain things. In statistics, how often a certain event happens is referred to as the frequency of that event.

The Mars Company states that their color blends for M&M's® were selected by conducting consumer preference tests, which indicate the assortment of colors that pleased the greatest number of people and created the most attractive overall effect. The company says that each large production batch is blended to certain ratios and mixed thoroughly. However, since the individual packages are filled by weight on high-speed equipment, and not by count, it is possible to have an unusual color distribution.

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In 2008, the Mars Company stated that M&M's® milk chocolate had the following ratio:

- 24% blue, 20% orange, 16% green, 14% yellow, 13% red, 13% brown

However, plain M&M's® are now produced at two different factories in the US. The two factories do not use the same mixture of colors! Therefore, you need to look on the packaging for the manufacturing code, which is usually stamped inside a rectangle. In the middle of the code will be the letters HKP or CLV. For example, the code might read 632GCLV20.

- CLV: The Cleveland plant uses the following proportion of colors for plain M&M's®: Red=0.131, Orange=0.205, Yellow=0.135, Green=0.198, Blue=0.207, and Brown=0.124.
- HKP: The Hackettstown, NJ, plant uses the following proportion of colors for plain M&M's®: Red=0.125, Orange=0.25, Yellow=0.125, Green=0.125, Blue=0.25, and Brown=0.125.

Provide students with the distribution ratio that you wish them to use.

Questions

- What is statistics? How is it used to explain something?
- How is frequency related to an event?
- Which color do you think will be the most common one in a package of M&M's?
- Do you think that each package will match the ratio distribution set by the Mars Company? Why or why not?
- If you are using the manufacturing location, ask students if they know where the candy is manufactured? Why would this be important?

Observation and Prior Knowledge

Ask your students what they already know about M&M's®. Have them write these facts and insights in their log.

Ask students to make some observations of the package (without opening the package) and create a list of initial observations in their log.

Question/Problem

Discuss that today their research questions will be related to how many of each color of M&M's® are in a bag and whether or not their findings match the Mars Company's ratio distribution. Make sure that students are provided with the ratio distribution that they should use.

Hypothesis

Have students identify the control group and the dependent and independent variables.

Note: Because there are so many variables in this experiment, it is not a true controlled experiment. However, you want the students to make this determination based on their questioning. Have students determine what types of things do stay the same, what they are testing and what they are measuring.

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Example:

Control Variables (conditions that stay the same) - Distribution ratio provided by the Mars Company, net weight of each bag

Independent Variable (what you are testing) – Number of each color in an M&M's® per bag

Dependent Variable: (what you are measuring). Amount of M&M's® and their colors found in each bag

Have students write a hypothesis based on the research question.

Sample hypothesis could be:

If the Mars Company sorters are working properly, then any difference between the color percentage in an actual package of M&M's® and the color percentage posted on the web site should be due to random chance.

If the Mars Company sorters are working properly, then the probability of getting a blue M&M® is 24%, an orange 20%, a green 16%, a yellow 14%, a red 13%, and a brown 13%.

Experiment and Document Data

Have students conduct their experiments and record their data. Using the data chart, have students determine the total number of candies per bag, as well as the frequency and the percentage of each candy color.

Have students determine the average of mean, as well as the median and mode for the total number of M&M's® per bag and the number of each color.
Students should notice that there is a variance in data for each bag of M&M's®.

Analyze the Data and Form a Conclusion

Have students review the data and determine whether or not the distribution ratio provided by the Mars Company is accurate. Have students graph the data in histograms, bar graphs, and/or pie charts (color-coded graphs follow easily from the M&M's® colors).

Questions (Bar Graphs)

Have students discuss frequency of each color of M&M's® in the package. It is useful for comparing the frequencies of each individual color to each of the other individual colors.

- In the average package of M&M's®, which color occurs most often (highest frequency)?
- Which color is the rarest (lowest frequency)?
- Do any of the colors have the same frequencies?
- Do you see any other trends in your data in the bar graph?

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Questions (Pie Chart)

This chart will identify what each portion of the whole bag is of each color. It is useful for comparing the relative proportion of each individual color to the whole population.

- What is the percentage of each color of M&M's® in the package?
- Looking at your data table and graphs, do you think you can predict what color(s) M&M's® you are most likely to pick from a package (probability)? If so, what color(s) is it?

Conclusion

Is the hypothesis correct or not? Why? How confident are you in your conclusion? Why? Why Not? Looking at your data table and graphs, do you think you can predict what color(s) M&M's® you are most likely to pick from a package? If so, what color(s) is it?

Follow-up

Discuss that by collecting the data from different bags of M&M's® they have what is termed multiple trials. The class should discover that the number of M&M's® per bag is not constant, nor is the number of each color in the bag resulting in variation between M&M's® bags and the potential for calculations using the data. Using the data from the class, address the idea of variance in data.

Ask: *From our data, what would be an accurate way to determine the number of M&M's in a random bag that I pick up at the grocery store?* Discuss that the average of the numbers provides an accurate description of the number of M&M's® in a randomly chosen bag.

Extensions

Let students brainstorm additional research questions and have them conduct the experiment.

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Experimental Procedure

In this experiment, you will be collecting statistical data that will either support or refute your hypothesis.

Observation and Prior Knowledge

- What do you already know about M&M's®?

- As you look at the package, what do you observe without opening the package?

Question/Problem

Predict the answers to the following questions:

- Are there the same number of candies in each bag?

- Are there the same number of each color in each M&M's® bag?

- Which color do you think is most common?

- Which color do you think is least common?

State the Problem

Hypothesis

Form a hypothesis

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Experiment and Record the Data

Complete the following chart. Determine the frequency and the percentage of each candy color.

Candy Color	Package					Total	Average (Mean)	Percentage
	1	2	3	4	5			
Blue								
Brown								
Green								
Orange								
Red								
Yellow								
Whole Bag								

What is the range for the number of each color?

What is the median for the total number of M&M's® per bag and the number of each color?

What is the mode for the total number of M&M's® per bag and the number of each color?

Analyze the Data and Form a Conclusion

Graph the Data

To compare your results to the ratio distribution from the Mars Company:

- Create a histogram or bar graph to visually display the frequency of each color of M&M's® in an average package as provided by the Mars Company.
- Create a histogram or bar graph to visually display the frequency of each color of M&M's® in the packages that you analyzed.
- Create a pie chart that provides the ratio distribution as provided by the Mars Company.
- Create a pie chart to compare the relative proportion of each individual color to the whole population.

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Write a Conclusion

Using the data, form a paragraph that answers the problem you looked to solve in the M&M's® lab, include how your actual results compared with your hypothesis. Was your hypothesis correct or not? How confident are you in your conclusion? Why? Why Not?

Looking at your data table and graphs, do you think you can predict what color(s) M&M you are most likely to pick from a package? If so, what color(s) is it?

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M&M's® Chemistry Lab

Research Question: Will M&M's® color dissolve faster in water or in another clear liquid?

Materials Needed: cups, masking tape, marker, water, isopropyl alcohol, mineral oil, vinegar, identical plain M&M's®, stopwatch (or timer)

Identify the Variables

Independent Variable	
Dependent Variable	
Constant Variable(s)	

Create a Hypothesis

Experimental Procedure

Use the appropriate number of cups for the number of liquids that you will use. Stick a piece of masking tape as a label on the side of each cup. With a marker, label the cups as Cup 1, Cup 2, etc.

Choose the same color of M&M's®. You will need one for each liquid. Drop one M&M® into each cup at exactly the same time and start the stopwatch as you drop each M&M®. Do not touch the candy or cups once you have started the experiment!

Carefully observe what is happening to the M&M's®. In the data table, record the time it takes for the color to completely come off of each M&M's®.

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Record the Data

The effect of different liquids on the time it takes for color to come off

Liquid	Time it took for color to come off
Cup 1: Water	
Cup :	
Cup :	
Cup :	

Draw Conclusions

What happened to the M&M's® in each cup?

Why is it important that the M&M's® are the same color?

Was your hypothesis supported? Why or why not?

What can you conclude about different liquids and how well they remove M&M's® color?

Are there different types of liquids that may have a different type of conclusion? What and why?

Would the color of the M&M® matter? Why do you predict it would or would not?

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Another Problem: Do the coatings of certain colored M&M's® dissolve in water faster than others? In order to investigate this, design an experiment to compare the speed at which each colored coating dissolves in water. Identify possible variables and ways to control them. After conducting the experiment, analyze the data. Answer the following questions:

- Does one color seem to move faster/slower than the others?
- Did other groups have similar results?
- Is there enough evidence from the experiments to conclude that a particular color of M&M's® moves faster in water than the others?

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Around the World with Different Currencies

SHORT ACTIVITIES
with THE NEW YORK TIMES

NAME _____ DATE_____

AROUND THE WORLD WITH DIFFERENT CURRENCIES

Directions: Turn to the "Foreign Exchange" tables located in the Business section of today's New York Times and choose three countries you would like to visit on a world tour (each from a different region of the world). Imagine that you are being given a five-hundred dollar budget to spend in each of your three destination countries. Figure out how many foreign currency units you will receive in exchange for your $500 American dollars in each country and enter those figures in the chart below. (You must multiply $500 by the most recent "Dollars in Foreign Currency" value to determine the equivalent foreign currency units.) (The first row of the chart contains an example based on an out-of-date currency value.)

Destination Country	World Region Where the Country is Located	Budget in American Dollars	Applicable "Dollars in Foreign Currency" Value Listed in Today's Times	Equivalent Foreign Currency Units (based on the most recent closing market price listed in the "Dollars in Foreign Currency" column of the Times table)
Chile	South America	$500	525.49	262,745 pesos

The New York Times KNOWLEDGE NETWORK | www.nytimes.com/nie

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A Graph is Worth a Thousand Words, or at Least 50…

NAME _____ DATE _____

A GRAPH IS WORTH A THOUSAND WORDS, OR AT LEAST 50…

Directions: Clip out one of the graphs found in today's New York Times and paste it into the box below. Then, explain in writing what the graph illustrates. You may make generalizations about the information in the graph instead of interpreting all of the information conveyed there.

paste graph here

Title of graph: _____

Type of graph (line, bar or circle): _____

Explain in writing what this graph illustrates:

_____

_____

_____

_____

_____

_____

_____

_____

The New York Times LEARNING NETWORK | www.nytimes.com/learning

08-1265-8

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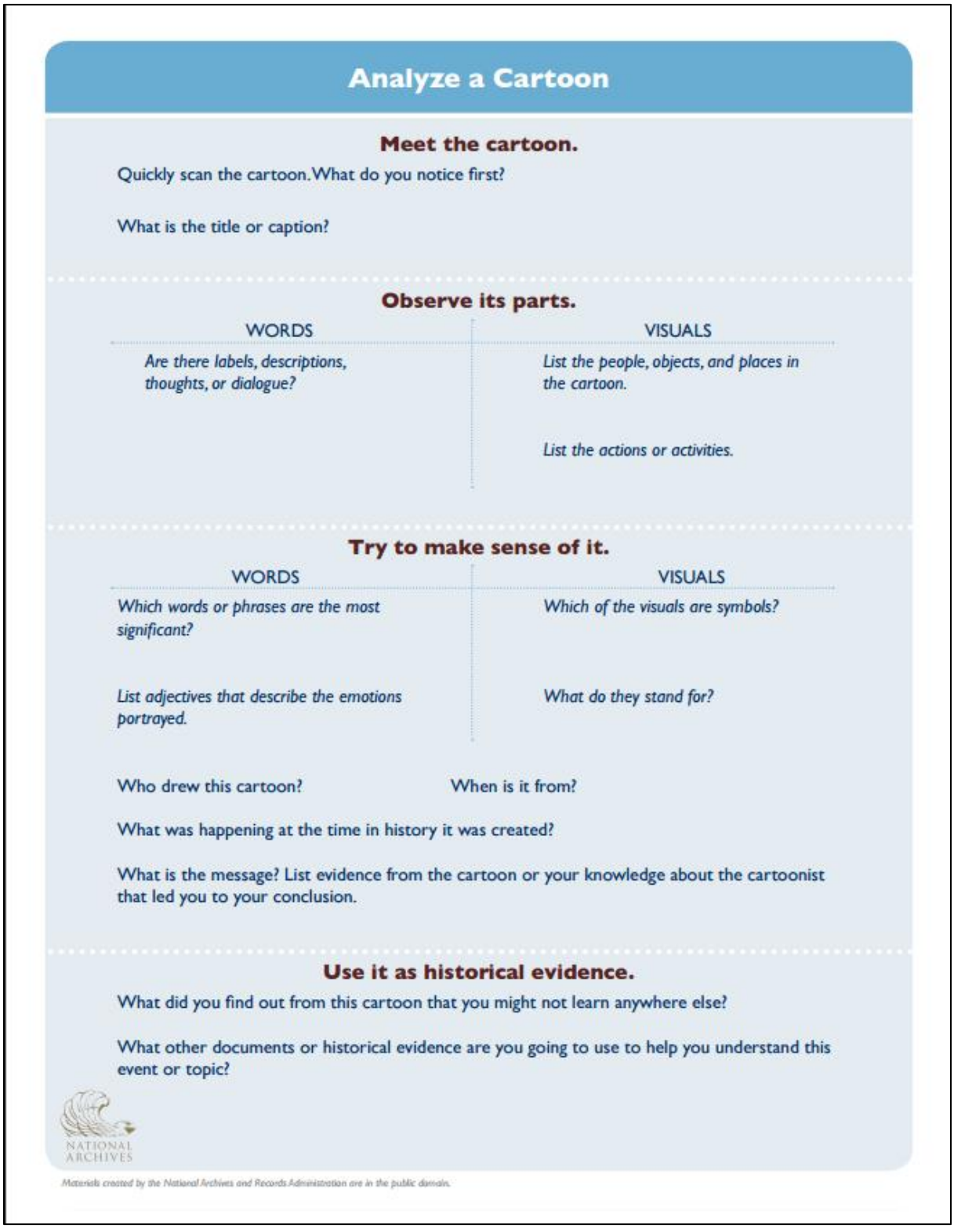
Analyze a Cartoon



Analyze a Cartoon

Meet the cartoon.

Quickly scan the cartoon. What do you notice first?

What is the title or caption?

Observe its parts.

WORDS	VISUALS
Are there labels, descriptions, thoughts, or dialogue?	*List the people, objects, and places in the cartoon.*
	List the actions or activities.

Try to make sense of it.

WORDS	VISUALS
Which words or phrases are the most significant?	*Which of the visuals are symbols?*
List adjectives that describe the emotions portrayed.	*What do they stand for?*

Who drew this cartoon? When is it from?

What was happening at the time in history it was created?

What is the message? List evidence from the cartoon or your knowledge about the cartoonist that led you to your conclusion.

Use it as historical evidence.

What did you find out from this cartoon that you might not learn anywhere else?

What other documents or historical evidence are you going to use to help you understand this event or topic?

NATIONAL ARCHIVES

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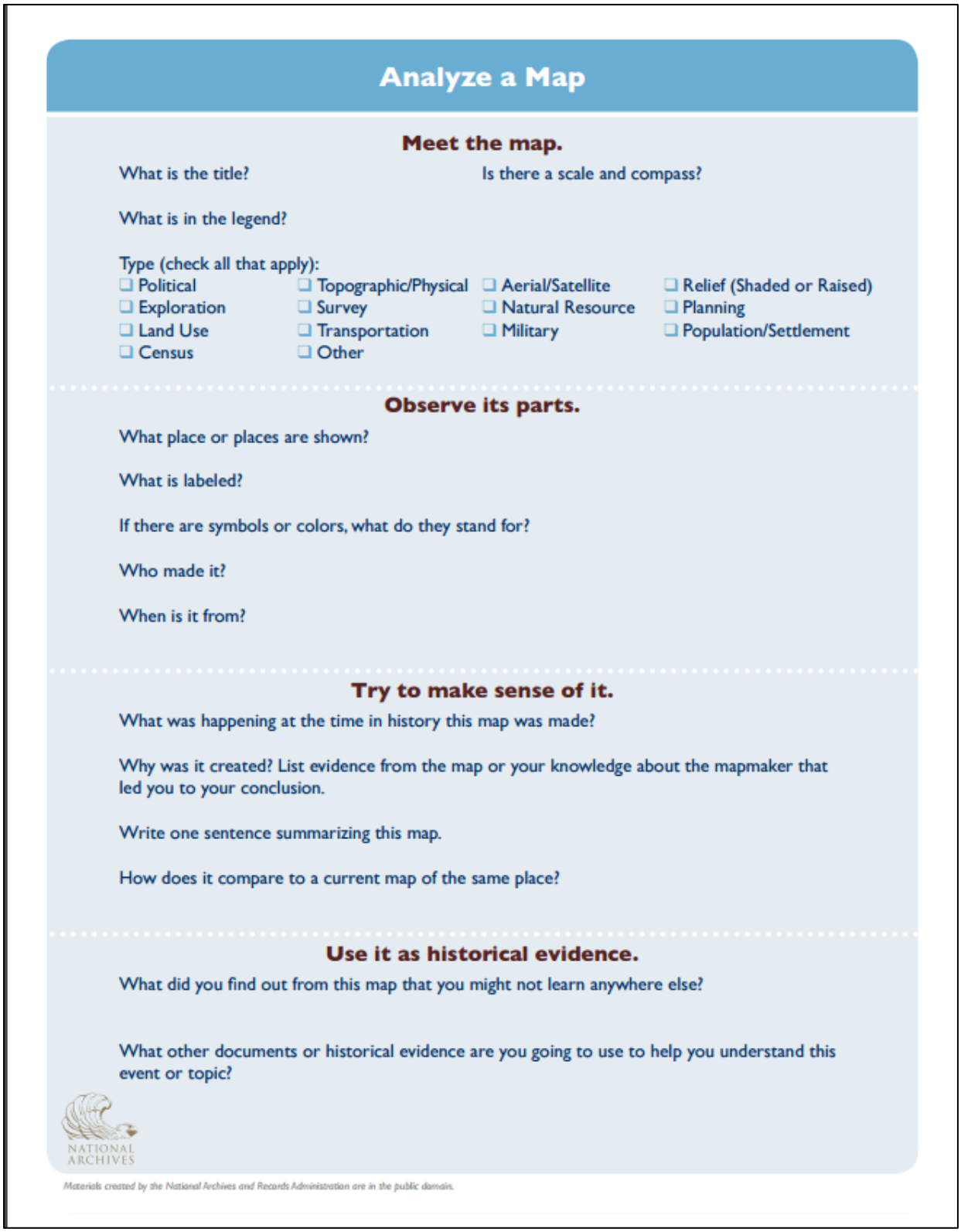
Analyze a Map



Analyze a Map

Meet the map.

What is the title?

Is there a scale and compass?

What is in the legend?

Type (check all that apply):

- ❑ Political
- ❑ Topographic/Physical
- ❑ Aerial/Satellite
- ❑ Relief (Shaded or Raised)
- ❑ Exploration
- ❑ Survey
- ❑ Natural Resource
- ❑ Planning
- ❑ Land Use
- ❑ Transportation
- ❑ Military
- ❑ Population/Settlement
- ❑ Census
- ❑ Other

Observe its parts.

What place or places are shown?

What is labeled?

If there are symbols or colors, what do they stand for?

Who made it?

When is it from?

Try to make sense of it.

What was happening at the time in history this map was made?

Why was it created? List evidence from the map or your knowledge about the mapmaker that led you to your conclusion.

Write one sentence summarizing this map.

How does it compare to a current map of the same place?

Use it as historical evidence.

What did you find out from this map that you might not learn anywhere else?

What other documents or historical evidence are you going to use to help you understand this event or topic?

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Resources from the World Wide Web

Data, Statistics, Graphics, and Editorial Cartoons

BBC: Bitesize and Skillswise
- http://www.bbc.co.uk/schools/gcsebitesize/
- http://www.bbc.co.uk/skillswise/mathsmaths/statistics/

Cartoons in the Classroom – part of Newspapers in the Classroom http://www.nieonline.com/aaec/cftc.cfm

Create a Graph NCES This federally funded site is great for teaching graphs and having students create their own graphs. http://nces.ed.gov/nceskids/graphing/index.asp

Daryl Cagle Cartoon Index http://www.cagle.com.

Data Representation Module 6: Unit 3.
https://wikieducator.org/images/9/90/JSMath6_Part2.pdf

Detroit News. Part of the Newspapers in the Classroom project, this site provides online articles, worksheets, editorial cartoons, and lessons already developed. http://nieonline.com/detroit/

KET Targeted Math. http://tdcms.ket.org/targetedmath/L.11GraphsChartsandTables.pdf

Learning Resources. Graph Types From Statistics Canada, this site has lots of information to use in the classroom, as well as some well-crafted lesson plans.
http://www.statcan.ca/english/edu/power/ch9/first9.htm

Library of Congress. Searchable database of primary source documents with references to CCSS and lesson ideas from lowest grade levels through high school. http://www.loc.gov/teachers/

Math is Fun! http://www.mathsisfun.com/data/

National Atlas.Gov This site provides free outline maps that can be printed for and used in the classroom. http://nationalatlas.gov/index.html

National History Education Clearing House Political Cartoons
http://teachinghistory.org/teaching-materials/teaching-guides/21733

Newsela. This site provides an innovative way to guild reading comprehension with nonfiction text that's always relevant. Each article is available in 4-5 different Lexile Levels with many of them providing a quiz that is aligned to a specific anchor standard. It is necessary to sign up for the free account to see the different level of articles. https://newsela.com/

Newspaper Map. Provides access to the front page of hundreds of newspapers, worldwide.
http://www.newspapermap.com

Sample Sites for Data for the Classroom
- **U. S. Census Bureau** http://www.census.gov/
- **Weekly Nielson Ratings** http://www.cnn.com/SHOWBIZ/TV/top10/content.html

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- **FedStats** http://www.fedstats.gov/
- **Sports Stats** http://sportsillustrated.cnn.com/baseball/mlb/ml/stats/
- **NFL Stats** http://www.nfl.com/stats/
- **NBA Stats** http://aol.nba.com/statistics/index.html

The Dirksen Center's Editorial Cartoon Collection (with lesson plans)
http://www.dirksencenterprojects.org/cartoons/index.htm

The Learning Network – Teaching and Learning with the New York Times. Articles and graphics for use in the classroom.
https://www.nytimes.com/section/learning

The Opper Project An on-line collection of historic editorial cartoons. Covering more than one hundred years of American history, the cartoons are organized topically with associated lesson plans. http://hti.osu.edu/opper/index.cfm

Tween Tribune. Daily news sites, including text, photos, graphics, and audio and/or video materials prepared by the Smithsonian about current events, history, art, culture, and science.
http://tweentribune.com

US History.org. This site provides access to numerous types of historic documents and nonfiction articles on U.S. history, ancient civilizations, and American Government. http://www.ushistory.org

YouTube – Phase Change Diagrams – excellent short video on basics of phase change diagrams
https://www.youtube.com/watch?v=JJSZbfXnBq4

Yummy Math – Great site with free lessons. Fee required to obtain answer solutions.
https://www.yummymath.com/

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- **"Tuesdays for Teachers" archived webinars**
  http://www.gedtestingservice.com/educators/exploring-the-2014-ged-test-webinar-archive

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